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FOREST PEST MANAGEMENT

Technology Update

Southern Region, USDA Forest Service, 1720 Peachtree Rd., N.W., Atlanta, Ga. 30367

Southern Pine Beetle Fact Sheet Number 42

Arkansas SPBMODEL -- A Computer Simulation Model

By M.P. Lih and F.M. Stephen

Purpose

This computer program predicts southern pine beetle (SPB) spot growth in currently infested stands over a 3-month period. *Arkansas SPBMODEL* estimates the number of infested trees, the cumulative total of dead trees, and the associated timber volume and dollar losses, in loblolly or shortleaf pine stands. This information serves as a decision-making aid for the forest pest manager.

Modeling allows the immediate application of basic research findings, and helps to identify and prioritize areas in need of additional research. *Arkansas SPBMODEL* also provides an efficient means of testing research hypotheses,such as the importance of an insect's natural enemies in controlling SPB spotgrowth.

Description

This model employs data collected from infested stands in southern Arkansas, Georgia, Louisiana, and Mississippi between 1975 and 1983. The model has been tested using data from 70 infested spots in five southern States. These tests showed a mean absolute error of 13.3 percent for predicted numbers of dead trees over a 92-day prediction period.

Required Inputs

1. Spot identification (for user's reference)
2. State in which infestation is located
3. Date the spot was ground checked
4. Desired number of days of prediction
5. Percentage of shortleaf and loblolly pines in the stand
6. Mean d.b.h. of the stand
7. Mean pine and hardwood basal areas
8. Number of trees currently infested with SPB
9. Number of trees previously infested with SPB
10. Data measurement units (English or metric)

Optional Inputs

1. General d.b.h. distribution of the stand
2. Predominant SPB lifestages (attacking beetles, egg, larvae, pupae, brood adults) present in the trees at breast height
3. Mean age of the pines
4. Average radial tree growth over the last 5 years
5. Desired temperature modification (degrees Fahrenheit)
6. Local stumpage prices for salvaged pine sawtimber and pulpwood

Standard Outputs

Daily or weekly prediction of spot growth for the requested period of time, including confidence intervals on the number of currently infested trees and the cumulative number of dead trees.

Optional Outputs

Estimate of total timber volume loss and associated dollar loss for the period of the simulation, based on the d.b.h. distribution input for the spot.

Accessibility

The model's interactive format is fast and easy to use. *A User's Guide* is available.

The personal computer version of the model will run on any IBM-compatible personal computer with at least 256K of memory, and an 8087 or 80287 math coprocessor. The model also requires MS-DOS 2.0 or above with an ANSI.SYS device driver.

The model may also be accessed through the USDA Forest Service's Data General

computing system. Remote accessing of the model through an interactive phone connection can be arranged by contacting Wesley A. Nettleton, Entomologist, USDA Forest Service, Forest Pest Management, 2500 Shreveport Highway, Pineville, LA 71360; telephone: 318/473-7286. Diskettes for the PC version of the model and copies of the *User's Guide* are also available at this address.

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Additional Information

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